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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/655,705	09/06/2000	Norikazu Sugiyama	28503.20058.00	3874

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EXAMINER

HASSANZADEH, PARVIZ

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 04/11/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/655,705

Applicant(s)

SUGIYAMA ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☒ Claim(s) 1, 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

Acknowledgment is made of applicants' claim for priority under 35 U.S.C. 120 of PCT/JP99/01055 filed in on March 4, 1999. It is noted, however, that applicants have not filed a certified copy of the PCT application and an English translation of the PCT application as required by 35 U.S.C. 120 (see MPEP 1895.01). Thus, due to the lack of the certified copy of the PCT application and an English translation of the PCT application, the claimed priority is denied in the present office action.

Claim Objections

Claims 1 and 2 are objected to because of the following informalities:

in claim 1, line 12, it is suggested to delete " $[(5^{\circ} \leq \theta \leq 30^{\circ})]$ ";

in claim 2, line 2, it is suggested to delete "of the depth" after "1/2".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 7, the limitation "the inner surface of each slit is sloped" is vague, it is suggested to insert "at least along the slit length" after "sloped";

In claim 5, line 9, the limitation "opening including a sloped inner surface" is vague, it is suggested to insert "at least along the slit length" after "surface".

It is also not clear whether one side or both sides of the slit is sloped.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-8 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Park et al (US Patent No. 6,176,696 B1).

Park et al teach a process apparatus (Figs. 1 and 6) including an airtight process vessel, a vacuum pump 18 (*exhaust system*) for exhausting gas from the process vessel, and a *baffle plate* 30 for partitioning the process vessel into a *process chamber* 10 for processing an object W and a vacuum chamber 24 (*exhaust passage*)

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communicating with the vacuum pump 18 (*exhaust system*) (column 1, lines 41-68 and column 4, lines 63-67),

Wherein the baffle plate 50 (30) includes a plurality of slits 52 radially formed in an annular ring 51 for discharging non-reaction gases and polymer by-products remaining inside the process chamber 10 to the vacuum chamber 24 (*baffle plates includes a plurality of slits through which the process chamber and the exhaust passage communicate with other*) (column 5, lines 9-13, Fig. 7);

Wherein the inner surface of each slit 52 having two distinct sections, an upper section 52a of the slit 52 is tapered with the width of the slit becoming narrower as one progress from the top surface of the baffle plate 50 to a designated depth within the baffle plate 50, and a lower section 52b of the slit 52 having a constant width ranging from the designated depth down to the bottom surface of the baffle plate 50, the area of the upper section of the slit at the upper surface of the annular ring is greater than that of the lower section of the slit at the bottom surface of the annular ring, and the ratio of the vertical height of the tapered upper section 52a and the vertical height of the vertical lower section 52b is preferably 1:1 to 5:1 (which is a narrower range than the claimed range of not less than 1/4) (*wherein the inner surface of each slit is sloped, the sloped surface being formed to having a depth not less than 1/4 of the thickness of the baffle plate*) and (*wherein for each slit the opening facing the process chamber is larger than the opening facing the exhaust passage*) (column 5, lines 26-45, Fig. 8);

wherein the inclination angle of the tapered upper section 52a ranges from 75° to 85° (this correspond to a range of 15° to 5° for their complement angles formed

between the sloped surface of 52a and an axis perpendicular to the opening of the slit and is a narrower range of angle than the claimed range of 5° to 30°) (*wherein for each slit an angle θ formed between the sloped surface and an axis perpendicular to the openings of the slit falls within a range from 5° to 30°*) (column 6, lines 12-14, Fig. 8).

Regarding claim 2: the ratio of the vertical height of the tapered upper section 52a and the vertical height of the vertical lower section 52b is preferably 1:1 to 5:1 (which is a narrower range than the claimed range of not less than $1/2$) (*wherein the depth of the sloped surface is formed not less than $1/2$ of the thickness of the baffle plate*) (column 5, lines 41-45, Fig. 8).

Regarding claims 3, 4, 7, 8: the baffle plate 50 (30) includes a plurality of slits 52 radially formed in an annular ring 51, and as shown each slit extending in a radial direction of the baffle plate 50 (*the baffle plate is shaped like a ring and the plurality of the slits are arranged radially on an entire circumferential surface of the baffle plate*) (column 5, lines 9-13, Fig. 7).

Regarding claims 5: as shown in Fig. 8, the inner surface of each slit 52 having two distinct sections, an upper section 52a that is tapered with the width of the slit becoming narrower as one progress from the top surface of the baffle plate 50 to a designated depth within the baffle plate 50, and a lower section 52b that has a constant width ranging from the designated depth down to the bottom surface of the baffle plate 50, the area of the upper section of the slit at the upper surface of the annular ring is greater than that of the lower section of the slit at the bottom surface of the annular ring, and the ratio of the vertical height of the tapered upper section 52a and the vertical

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height of the vertical lower section 52b is preferably 1:1 to 5:1 (the ratio value of 1:1 is equivalent to $1/2$ when expressed in term of the depth of the sloped section, h_1 , to the thickness of the baffle, H , or the depth of the perpendicular section, h_2 , to the thickness of the baffle, H , that is, $h_1/H = 1/2$ and $h_2/H = 1/2$) (*wherein the process-chamber opening includes a sloped inner surface formed not more than $1/2$ of the thickness of the baffle plate, $h_1/H \leq 1/2$; and wherein the exhaust-passage opening includes an inner surface that is substantially perpendicular to the surface of the baffle formed not more than $1/2$ of the thickness of the baffle plate, $h_2/H \leq 1/2$*) (column 5, lines 26-45, Fig. 8).

Regarding claims 6: as discussed above regarding claim 5, the ratio value of 1:1 is equivalent to $1/2$ when expressed in term of the depth of the sloped section, h_1 , to the thickness of the baffle, H , or the depth of the perpendicular section, h_2 , to the thickness of the baffle, H , that is, $h_1/H = 1/2$ and $h_2/H = 1/2$ which is the same as the upper value of the claimed range $1/4 \leq h_1/H \leq 1/2$ and $1/4 \leq h_2/H \leq 1/2$ (*wherein the inner sloped surface of the process-chamber opening and the inner surface of the exhaust-passage opening are formed to have depths not less than $1/4$ of the thickness of the baffle plate*).

Regarding claims 10: the inclination angle of the tapered upper section 52a ranges from 75° to 85° (this correspond to a range of 15° to 5° for their complement angles formed between the sloped surface of 52a and an axis perpendicular to the opening of the slit and is a narrower range of angle than the claimed range of 5° to 30°) (*wherein for each slit an angle θ formed between the sloped surface and an axis*

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perpendicular to the openings of the slit falls within a range from 5° to 30°) (column 6, lines 12-14, Fig. 8).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5, 8, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US Patent No. 6,176,696 B1).

Park et al teach a process apparatus (Figs.1) including an airtight process vessel, a vacuum pump 18 (*exhaust system*) for exhausting gas from the process vessel, and a *baffle plate* 30 for partitioning the process vessel into a *process chamber* 10 for processing an object W and a vacuum chamber 24 (*exhaust passage*) communicating with the vacuum pump 18 (*exhaust system*) (column 1, lines 41-68),

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Wherein the baffle plate 30 includes a plurality of slits 34 radially formed in an annular ring 32 for discharging non-reaction gases and polymer by-products remaining inside the process chamber 10 to the vacuum chamber 24 (*baffle plates includes a plurality of slits through which the process chamber and the exhaust passage communicate with other*) (column 2, lines 10-14, Fig. 2);

Wherein the inner surface of each slit 34 (Fig. 3) having three distinct sections, an upper section facing the process chamber and being tapered with the width of the slit becoming narrower as one progress from the top surface of the baffle plate 30 to a designated depth within the baffle plate 30, and a bottom section facing the exhaust chamber and having a constant width, and intermediate section such that the upper section and the bottom section communicate with each other (column 2, lines 15-36, Fig. 3);

Park et al fail to explicitly disclose:

the sloped inner surface of the process-chamber opening and the inner surface of the exhaust-passage opening formed not more than 1/2 of the thickness of the baffle plate; and

wherein the width W1 of the process-chamber opening and the width W2 of the exhaust-passage opening are set to satisfy a condition of $1 \leq W2/W1 \leq 1.4$.

Park et al also teach a slit 52 having a loped upper surface having a depth of 1/2 of the thickness of the baffle as discussed above in order to enhance the cleaning-life time of the baffle (column 6, lines 27-53).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to make the depth of the sloped section of the slit 34 (Fig. 3) according to the teaching of Park et al (Fig. 8) in order to increase the cleaning life-time of the baffle (column 6, lines 27-53). The resulting slit would have $h1/H = 1/2$ and $h2/H < 1/2$ which satisfy the requirement of $h1/H \leq 1/2$ and $h2/H \leq 1/2$.

Regarding claim 8: the baffle plate 30 includes a plurality of slits 34 radially formed in an annular ring 32, and as shown each slit extending in a radial direction of the baffle plate 30, and as shown in Fig. 3 the slit slopes from an opening rim of the slit (each slit extends in a radial direction of the baffle plate, and the inner sloped surface of the process-chamber opening slopes from an opening rim of the slit, which faces the process chamber, toward the exhaust-passage in which direction of the opening of the slit is narrowed) (column 2, lines 10-34).

Regarding claim 11: Even though there is no indication that the drawing (Fig. 3) is scaled, the width of the slit opening at the bottom section is at least equal to the width of the slit opening at the upper section, that is, $1 = W2/W1$. Furthermore, it was held in *re Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984) that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US Patent No. 6,176,696 B1) in view of Mautz (US Patent No. 5,904,800).

Park et al teach all limitations of the claims except for the sloped surface of each slit being smooth.

Mautz teaches a process apparatus including a liner 220 for allowing particles 235 and polymers to be directed toward a pumping port 239. The liner has preferably a silk or non-adhesive surface which can be obtained by various method including reducing surface irregularities (smoothing) in order to reduce the amount of particles adhered to the liner (column 4, lines 27-42).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to reduce the surface irregularity on the sloped surface of the slit as taught by Mautz in order to reduce adhesion of particle to the surface of the slit and thus allowing the particle to be directed toward the exhaust-passage.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Walko,II (US Patent No. 6,051,100) teach a plasma reactor including a containment structure 40 (*baffle plate*) having a plurality of openings 4, each opening having a uniform diameter along the width of the containment structure 40 and the openings being arranged at different angles along the containment structure 40; and

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Gupta et al (US Patent No. 6,159,333) teach a plasma reactor including a baffle plate 17 having a plurality of spaced holes 23 extending into an annular vacuum manifold 24.

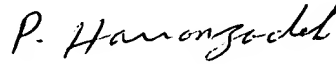
Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.


Parviz Hassanzadeh
Examiner
Art Unit 1763

April 5, 2002